

*REMARKS*

Claims 1-15 were rejected in this application. Claims 8 and 12 were cancelled. Claims 1, 6, 7, 9, 10 and 15 were amended. New claims 16-22 have been added. No new matter has been added by these amendments. Reconsideration of claims 1-7, 9-11 and 13-22 in view of the foregoing amendments and following remarks, and indication of the allowability thereof are respectfully solicited.

The applicants first thank the Examiner for careful consideration of the applicants' Response to Restriction Requirement dated June 6, 2008, and withdrawing the restriction requirement.

Claims 1, 6, 7 and 12 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Specifically, the Examiner called out "the wall" in claim 1 as lacking antecedent basis. Also, the Examiner requested clarification of "grate". Thus, the applicants have amended claim 1 accordingly. As amended, claim 1 now recites "Device for the continuous photocatalytic purification of the air of an inhabited room, in the form of a wall element (1), comprising . . . a filter comprising a grate covered by a film . . ." Claim 6 has been amended to more clearly state what the equation is intended to determine. As amended, claim 6 now recites ". . . said surface of the meshes of the expanded steel ( $S_{\text{steel}}$ ) being defined as . . ." Claim 7 is amended such that the ratio is denoted with  $s_{\text{steel}}$  to distinguish it from the physical surface,  $S_{\text{steel}}$ . Claim 12 has been cancelled without prejudice to the applicants' rights therein. Thus, the rejection to claim 12 is now moot. Reconsideration of these rejections is respectfully solicited.

Claims 9, 10 and 15 have been amended to correct the antecedent basis in light of the claim 1 amendments.

The Examiner has rejected claims 1-15 under 35 U.S.C. §103(a) as being unpatentable over Hirayama (US 6,048,499) in view of Yates et al. (US 2004/0136863) and Jones (US 5,925,320). In response, applicant has amended claim 1 to include claim 8 that more clearly distinguishes over the art, and has added new dependent claims 16-22, each of which further distinguishes the art as well.

Claim 1 has been amended and now includes all limitations of claim 8. Claim 8 has been cancelled accordingly. As amended, claim 1 now recites ". . . wherein the at least one grate is arranged vertically, substantially parallel to the external metal structure, and supported only by fixings on the perimeter of the at least one grate." In rejecting claim 8, which is now incorporated into claim 1, the Examiner relied on Hirayama for the limitations of claim 1 and admitted that Hirayama fails to teach at least one grate made of expanded metal covered by a TiO<sub>2</sub> film. Then, the Examiner relied on Yates et al. stating that Yates et al. discloses expanded metal sheets, which are "supported around the perimeter" referring to paragraph [0036].

However, the panel of the Yates et al. reference is **not only** supported by a frame around its perimeter, but also by front and rear support structures. Specifically, Yates et al. states in paragraph [0036], lines 8-10, "[t]he panel 210 includes a support structure comprising a frame 410 and front and rear support surfaces 420 and 422 (FIG. 6)." The front support structure 420 is also clearly illustrated in FIG. 4. However, claim 1, as amended, now requires that the at least one grate be supported **only** by fixings on the perimeter. This feature may provide advantages as discussed in the specification of the present application. For example, the applicants stated in paragraph [0061], "[t]o avoid cluttering up the wall with internal reinforcement, the expanded metal used must be able to be maintained vertical with fixings only on the perimeter of the grate." The applicants further explained "[t]he last selection criterion for the expanded metal type depends on its structural rigidity." Thus, the expanded metal is selected such that it has the structural rigidity to maintain its vertical arrangement, supported only by the fixing on the perimeter. *See* the present application specification at paragraph [0061].

Dependent claims 19 and 20 have been added to more clearly state the above discussed features and even further distinguish the Yates et al. reference. As such, further attention should also be directed to these claims.

Further, and separately in relation to claim 1, the Examiner asserted that Hirayama teaches "the filter in a vertical arrangement", referring to figures 5A-D. However, a closer review of the Hirayama reference reveals that the filters are not arranged vertically. Specifically, Hirayama explains in the brief description of the

drawings section in column 3, lines 52-67, that FIGS. 5A-D are "a schematic illustration showing possible alternative arrangements of a photocatalyst and filters to be used for the embodiment of antiseptic clean system of FIG. 1", and FIG. 3 is a schematic sectional side view of the antiseptic cleaning system of FIG. 1. That is, the photocatalyst and filter arrangements shown in FIGS. 5A-D are intended to be used in the cleaning system of FIGS. 1 and 3. However, if the filters and the photocatalyst were arranged vertically as suggested by the Examiner, the Hirayama's cleaning system will be rendered inoperable since the light introduced through the optical guide 15 will be blocked by opaque prefilter(s) 16, 17.

Further, Hirayama states in column 5, lines 7-15, "[i]t is particularly advantageous to arrange a prefilter 10 or a middle efficiency filter 17 **upstream** relative to the photocatalyst 10 and an ultra low penetration air-filter (ULPA) 18 **downstream** relative to the photocatalyst 10." (Emphasis added.) "Upstream" and "downstream" clearly relate to the flow path in FIG. 3, such that the upper outlet opening 12 and the lower inlet opening 11 necessarily define the vertical axis in the Hirayama system. As shown in FIG. 3, air enters the cleaning system from the air inlet 11 and flows vertically upward and exits out via the air outlet 12. Therefore, when the quoted statement is read in the context of FIG. 3, the filters and the photocatalyst must be arranged horizontally or diagonally, as shown in FIG. 3, such that the air flows through the prefilter 10 and middle filter 17, the photocatalyst 10 and the ULPA filter 18, in that order. Hirayama does not teach the vertical arrangement of the grate as claimed in claim 1.

Therefore, in light of foregoing remarks, the applicants respectfully submit that Hirayama and Yates et al. fail to teach limitations of claim 1 requiring the vertical arrangement of the grate which is only supported by fixings of the perimeter. Further, Jones, which the Examiner relied on only for its teaching of an external metal structure, does not cure this deficiency. Reconsideration and indication of the allowability of claims 1, 19 and 20 are respectfully solicited.

Claim 16 has been added to more clearly state the claimed invention wherein an air flow path in the wall element is substantially parallel to the filter, as shown in FIGS. 1, 2 and 8, and described in paragraph [0036]. Such an air flow path is not disclosed in any of the cited references. Particularly, the limitation requiring an air

flow path substantially parallel to the filter is distinguishable from Hirayama and Yates et al., wherein air flows perpendicularly or substantially perpendicularly through the filter(s). *See* Yates et al. figure on the front cover page and FIGS. 1 and 2; and Hirayama FIG. 3.

Claims 17, 21 and 22 have been added to more clearly state the UVA lamps arrangement in the claimed invention to further distinguish from the cited references. The UVA lamps, as claimed, are attached on the internal metal frame such that the lamps are arranged between the at least one grate and the external metal structure, as shown in FIGS. 2 and 8 of the present application. Thus, when there are more than one grates, the UVA lamps are not arranged between the grates. Such an arrangement of the lamps is not disclosed in any of the cited reference, and particularly distinguishable from Yates et al., wherein the lamps 250 is arranged between panels 210. *See* Yates et al. FIGS. 2, 13 and 14.

Claims 2-7, 9-11, and 13-20 depend from claim 1, thus patentable at least for the reasons stated with regard to claim 1. Reconsideration and indication of the allowability of claims 2-7, 9-11, and 13-20 are respectfully solicited.

Additionally, claim 2 recites "the external metal structure is made of steel or has an internal surface covered by a thin layer with a reflective index greater than 90% for wavelengths shorter than 400 nm." In rejecting claim 2, the Examiner stated "[i]t would have been obvious to one of ordinary skill in the art to choose a stainless steel, where the results are not unexpected." However, the cited references fail to teach the limitation of claim 2 requiring the internal surface of the metal structure having a reflective index greater than 90% for wavelengths shorter than 400 nm. Reconsideration of claim 2 and its dependent claim 3 and indication of the allowability of claims 2 and 3 are respectfully solicited.

Claim 6 recites "the expanded metal is a expanded steel" and "the entire surface of the meshes . . . is covered with the TiO<sub>2</sub> film, with exception of the surface of the thickness of the mesh." As discussed above, the Examiner relied on Yates et al. for its teaching of "expanded sheets". However, Yates et al. teaches that the expanded sheets are "made of aluminum". Yates et al. at [0038]. Further, the expanded sheets are coated throughout their thickness, because they are coated by dipping/submerging

In re Appln. Of: Laurent Geron et al.  
Application No.: 10/574,047

processes. *See* Yates et al. at [0040]-[0045]. However, claim 6 requires that the surface of the thickness of the mesh is not covered with TiO<sub>2</sub> film, which is possible because TiO<sub>2</sub> is deposited on a continuous steel sheet before it is expanded, as explained in paragraph [0057] of the present application. Therefore, Yates et al. fails to teach all limitation of claim 6, and Hirayama and Jones do not cure this deficiency. Reconsideration and indication of the allowability of claim 6 and its dependent claim 7 are respectfully solicited.

### Conclusion

The application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

### Extension of Time and Fee Deficiency

The Commissioner is authorized to charge the fee for a three-month extension of time. If any additional fee is required, or any overpayment is made in connection with this communication, please charge or credit deposit account No. 50-3505.

Respectfully submitted,

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